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The JOURNAL of GEOGRAPHY

VOLUME XLIX FEBRUARY, 1950 NUMBER 2

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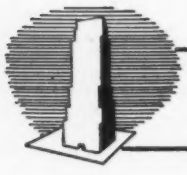

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The JOURNAL *of* GEOGRAPHY

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Dr. Winther is Associate Professor of History; Assistant Dean, Graduate School, Indiana University, and author or editor of eight volumes relating to American far west history. The latest is The Old Oregon Country. He is also author of many articles in professional periodicals. During 1945-46 he was Research Fellow at the Henry E. Huntington Library, San Marino, California, and worked there on the history of metropolitan Los Angeles.

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Mr. Miller is Assistant Professor of Geography at the University of Utah and has contributed a number of articles to *Economic Geography*.

Mr. Highsmith is Assistant Professor of Geography at Oregon State College. His special field of interest is Asia and agricultural geography. He was co-author with Mr. Miller of an article dealing with the Yakima Valley fruit industry in *Economic Geography*.

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VOLUME XLIX FEBRUARY, 1950 NUMBER 2

LOS ANGELES: ITS AQUATIC LIFE LINES

OSCAR OSBURN WINTHER
Indiana University

ACQUIRING A WATERSHED

As fanfare ushered in the present century, no other American city seemed to offer a more glowing future than did Los Angeles, then a city of one hundred thousand and the nation's leading spa. It was, moreover, the recognized metropolis of the Southwest. Actually, tho, there was good reason for pessimism. Los Angeles, built on the fringe of the scorching Mohave Desert, faced the prospect of ruinous drought. Noble Los Angeles River, the city's source of drinking water since the Spanish days, was running dry; natural underground reservoirs were being emptied by pumps; and an anxious Water Board, scouring the sun-baked countryside, saw no relief in prospect. In 1904 the crisis came. "The question of water supply," reads the *Yearly Report* of the Los Angeles Water Board, "has reached the acute stage."

At such a time former Mayor Fred Eaton must have appeared like a Moses in modern dress when he came to the City Water Board with news that he had found a new water supply for Los Angeles.

Eaton liked to be out of doors, and in the summers he often went on camping trips. One of these trips took him to Owens River Valley in Inyo County, 250 miles away and high above Los Angeles in the Sierra Nevadas. Dominating the scene was Mount Whitney, America's loftiest peak, and down its sides came melted snows that formed the icy fresh and pure waters of Owens River. The river emptied into Lake Owens, a brackish stagnant body with no visible outlet to the distant sea. To Eaton it seemed a pity that this mountain fresh river should serve no better purpose than the filling of a desert lake. He believed it possible to divert the river from the

FIG. 1. A Zanjero. Guardian of Los Angeles' water supply when it ran thru town in open ditches.

lake to an aqueduct leading to Los Angeles, and he decided to approach that city's Water Board regarding his scheme.

For advice on the practicality of the idea, the Board turned to its chief works engineer, Belfast-born William Mulholland. Tall, gauche, sagacious "Bill" Mulholland had come to Los Angeles in the late 'seventies and had begun his career as a humble *zanjero* or caretaker of the water ditches. He was of the race of "doers," tempering his activity with common sense and a timely thrift that was pleasing to the then extremely frugal city administration. Mulholland was fond of saying that he learned the virtue of frugality from his Pittsburgh uncle who tied his goat on a tin roof near the railroad tracks. Every time a train went by, the firemen heaved coal at the goat and Mulholland's uncle hurried out to collect the addition to his winter's fuel supply.

Mulholland surveyed the Owens Valley project and reported to the water commissioners that, from an engineering standpoint, it was both possible and practical. He estimated the cost at approximately 23 million dollars—a staggering sum that the commissioners figured could be raised only by sale of municipal bonds. He saw only one major obstacle—trouble over the water rights of Inyo County farmers and the newly-created United States Reclamation Service which in 1902 had selected Owens Valley as one of its proposed irrigation developments.

Then a remarkable thing happened. J. B. Lippincott, Reclamation Service representative, suddenly resigned from the federal

agency and accepted a position with the Los Angeles Water Board. Simultaneously, the Reclamation Service decided to drop the Owens Valley project and the cause of the Inyo County farmers in favor of the aqueduct scheme.

Up to this time, in spite of a rapidly widening area of involvement, the aqueduct plan had remained the secret of a small number of "insiders"—a group that included members of the Los Angeles press and which seemed to have a single idea, viz., obtaining all possible land and water options in the territory to be touched by the aqueduct.

On June 29, 1905, however, the *Los Angeles Times* broke the gentlemen's agreement regarding simultaneous publication of the story. "Titanic Project to Give City a River Option Secured on Forty Miles of River Frontage in Inyo County—Magnificent Stream to be Conveyed Down to the Southland in Conduit Two Hundred and Forty Miles — Stupendous Deal Closed," ran the *Times* headline, full of the traditional California superlatives.

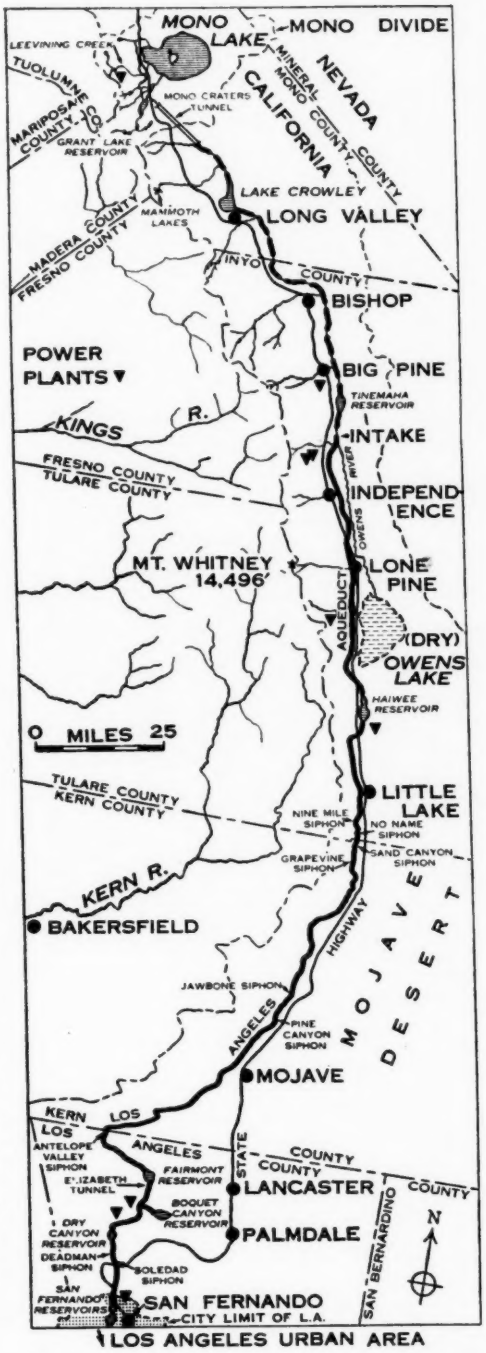

FIG. 2. Map of the Municipally Owned Los Angeles Aqueduct. Drawn by Ronald Ives.

The *Times* story described the project as the most important development in the history of Los Angeles and added that plans

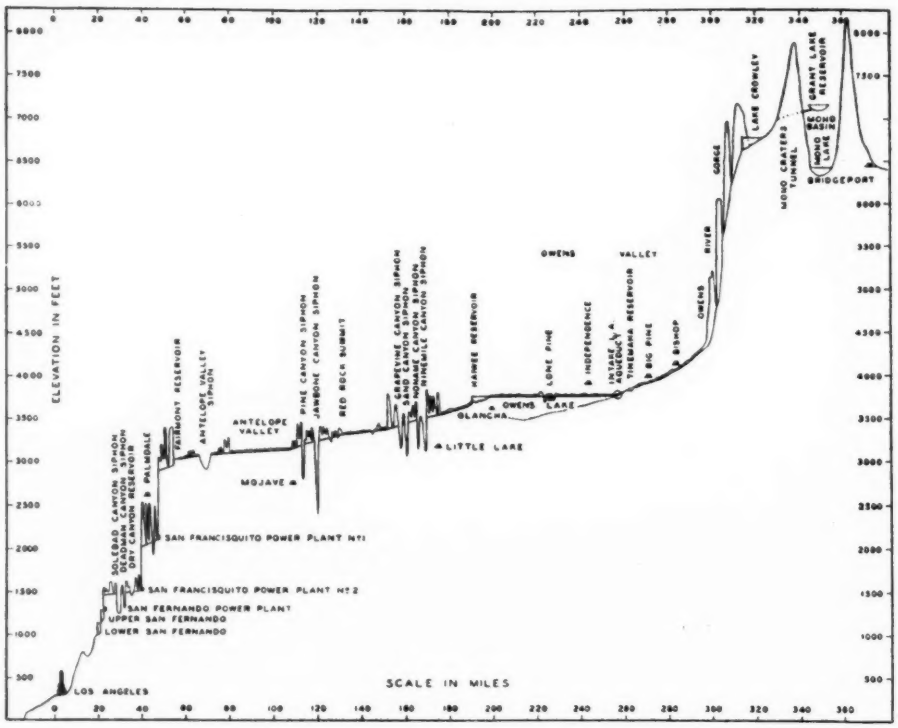

FIG. 3. Elevations of the Los Angeles Aqueduct.

called for the sale of water to San Fernando Valley where General Harrison Gray Otis, editor of the *Times,* his son-in-law, Harry Chandler, and E. T. Earle of the *Los Angeles Express* (all sharing in the secret) were personally acquiring property at ridiculously low prices. That enormous profits could be made out of such real estate investments was indeed inevitable.

Subsequent to the public announcement, the United States Congress passed a bill which was signed by President Theodore Roosevelt which not only removed federal restrictions but removed all limitations on Owens River water for use by Los Angeles. Gifford Pinchot, chief of the Forestry Bureau, also lent his support to the aqueduct plan when he declared 200,000 acres in Owens Valley to be "forest" (altho no forests were in sight) and thereby put an end to further homesteading and settlement in the region. Also an Act of Congress (June, 1906) gave to Los Angeles a right-of-way over public lands.

And so on November 24, 1905, the Los Angeles City Council voted to take up its cheaply acquired options on Owens Valley

land and water rights. "This action means," wrote Hearst's *Los Angeles Examiner* on the day following, "that the city has officially accepted the Owens River water project as proposed, and work will proceed toward construction of the conduit and bring water to Los Angeles." Each step taken by Los Angeles and the United States government was technically legal and the prevailing philosophical justification was: the greatest good for the greatest number.

When the *Times* had first revealed the aqueduct story in June, it had carried a box story dispatched directly from Owens Valley

FIG. 4. Aqueduct Construction Operations. This is a siphon section weighing twenty-four tons being pulled by mule teams.

in which it reported "Everybody in the Valley has money and everybody is happy." This was not wholly true. In fact, a large percentage of the Valley's inhabitants were very unhappy.

To the farmers of the region, providing water at their expense for Los Angeles seemed scarcely justifiable. To take water needed for agriculture and sell it to the speculators who were planning a fertile, fruitful San Fernando Valley was an outrage and a "betrayal of Inyo County."

From this point on, the people of Owens Valley staged a prolonged and dogged resistance to every subsequent move made by Los Angeles—some of them even resorting to open violence and bloodshed. But in the end the battle was a losing one.

LOS ANGELES BUILDS WORLD FAMOUS AQUEDUCT

Permanent construction of the Los Angeles aqueduct under Mulholland's direction began in October 1908. In an age when

municipal projects inspired little confidence, the building of the conduit, largest municipal enterprise of the time, was accomplished with such speed, skill, and economy that it became one of the marvels of the engineering world.

Its course began at an intake point 12 miles above Independence and with an elevation of 3,814 feet. Its terminal point, the San Fernando Reservoir, had an elevation of 300 feet. In traversing the distance from beginning to end, the aqueduct skirted the east side of the Sierras and crossed Mohave Desert before reaching Los Angeles. Because of the varied terrains and levels, many types of conduits were used, among them huge steel inverted siphons, but the standard conveyor was a concrete lined ditch 8.2 feet high, 11.5 feet wide at the top, and having a reinforced concrete cover.

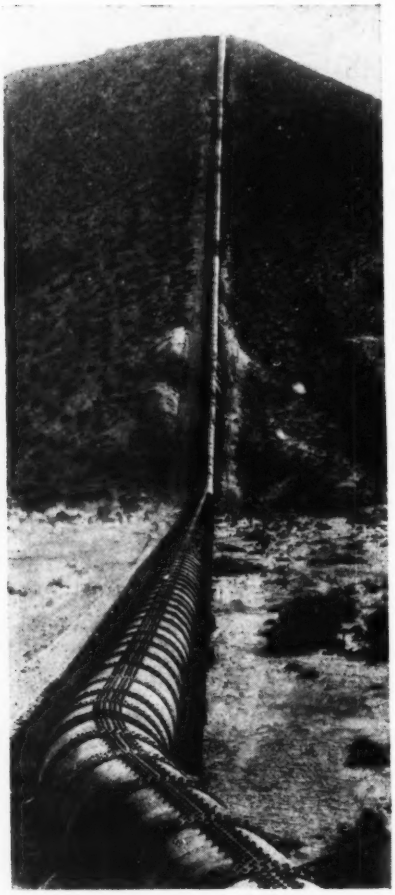

FIG. 5. Famed Jawbone Siphon. The most spectacular of numerous siphons of the Los Angeles Aqueduct.

Construction operations also necessitated building of desert and mountain roads, water for construction needs, electrical power and machinery, telephone lines, machine shops, barns, stables, and blacksmith shops. Plans had to be made, too, for the feeding, housing, and medical care of the 4,000 construction workers scattered along a route where alkali dust storms were numerous and where the temperature ranged from 110° in the summer to below zero in the winter.

The city manufactured much of its own cement, bought its own livestock and vehicles, and organized its own transport facilities along the desert mountain route. Twelve animal teams were hitched to two-wagon outfits to haul equipment from rail terminals. Tractors, some of caterpillar type, were tried for traction work, but

at that time repairs and operation costs for them made their bids run to about twice those of the teamsters.

By far the most difficult phase of construction was the building of 164 tunnels that covered a total of 42.9 miles. All construction plans were geared to the time it would take to complete the longest of these—the Elizabeth tunnel—which ran 26,870 feet. It was completed February 28, 1911, 450 days ahead of schedule and in world-record time for tunnel-building.

On November 5, 1913, the Los Angeles Aqueduct was officially opened, "carrying water," according to the *Los Angeles Examiner,* "farther than it had ever been carried to any city in the world." Running at one-third its capacity, it provided the Los Angeles of 1913 with three times as much water as it could then use.

Thirty thousand people crowded around the San Fernando outlet that day to acclaim the work of William Mulholland. "The horns of thousands of automobiles blared," wrote the *Examiner* in describing the occasion of the opening; "two field guns roared a quick salute . . . the band played 'Yankee Doodle.' " Then the gates opened and the water rushed in. This time it was Mulholland, not Eaton, who was a modern Moses, for literally he had smitten the rock and water came out of it.

DRY CYCLES AND TROUBLES

Not until the early 'twenties when a succession of dry years occurred did the Angelinos fear for their water supply again. Water in the aqueduct then began to run low. About half of the water was used for irrigation in San Fernando Valley, and at the rate of 1924 consumption the city's reservoir held only a four months' supply. Engineers rushed out into Owens Valley and installed huge electrically driven pumps in the hope that water pumped into the aqueduct could compensate for what the streams failed to supply. But this too proved inadequate.

Thoroly alarmed, the city set its eyes on the far north end of Owens Valley which had hitherto escaped exploitation, and once again trouble broke out in Inyo County. Using high-pressure methods, city agents secured control of the McNally ditch connecting with Big Pine ditch, which irrigated the farms around the town of Big Pine. Trouble broke loose when in an effort to divert this new source of water into the aqueduct system Los Angeles engineers sought to construct a short connecting canal. To the

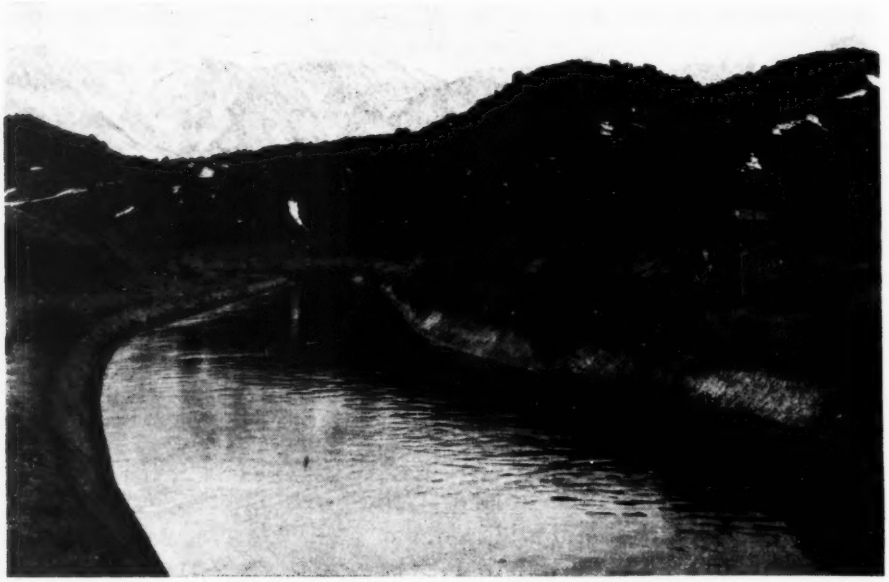

FIG. 6. Fresh from the Snowclad Sierra Nevadas. An open concrete lined section of the Los Angeles Aqueduct in Owens Valley above Intake.

ranchers who owned the Big Pine ditch, the City's move represented a further threat to Inyo water rights. Big Pine ranchers loaded rifles and shotguns and drove off the city workers.

Faced with this situation, Los Angeles bought out en bloc the Big Pine district for over a million dollars. The sale, however, did not include the town of Big Pine, a community with a new $100,000 school, a church, bank, business district, and many fine homes; and its residents, left literally high and dry, faced inevitable ruin.

But the city continued buying on a "checkerboard" system. Bishop, the "hub" of Inyo County, felt threatened. Those who failed to sell faced possible ruin, and resentment continued to rise until November 10, 1924, when a mob of about one hundred Bishop men seized a vital spillway and diverted the water back into Owens Lake. The insurrectionists soon reached a thousand in number. They stood guard in relays while the women of the Valley kept them supplied with food.

It looked like impending civil war. Owens Valley men felt "goaded to desperation," according to the *Owens Valley Herald;* several Los Angeles papers referred to them as "mobs" and "anarchists." The *Bulletin* of the Municipal League of Los Angeles on July 15, 1924, tried to summarize the situation fairly:

"Discounting much of what he hears as sheer bluff, an observant visitor must nevertheless admit an ugly situation. And an important factor is the city's program of the past eighteen months of buying out the ranchers individually with the result that those who refuse to sell are isolated in areas containing farms which the city has allowed to lapse back into semi-desert condition." Many settlers left in the southern end of the Valley were friendly to Los Angeles, but those in the north end the *Bulletin* found fuming with discontent.

Reversing its former position, the *Los Angeles Times* now took a calming view. "It is to be remembered that these farmers are not anarchists nor bomb-throwers, but, in the main, honest, earnest, hard-working American citizens who look on Los Angeles as an octopus about to strangle out their lives. . . . There must be no civil war in Southern California."

Shortly after this, Los Angeles made offers of settlement, and the men from Bishop withdrew. When nothing much came of the offers, occasional dynamitings occurred and Mulholland received death threats, so he said, "by the dozen."

In summarizing the controversy, W. A. Chalfant, out-spoken Bishop publicist and editor of the *Inyo Register,* wrote on November 27, 1924: "Inyo has no resentment at the city, but at those who are permitted to lord it over Owens Valley for a score of years. The development of one of the best parts of California has been crippled, possibly killed. . . ." And on January 7, 1925, he wrote again of the gloom that had settled over the Valley: ". . . coyotes howl now where the voices of youngsters once made the little schoolhouse an influence in the community for good."

Since then, the city of Los Angeles very largely has had its own way in Owens Valley and has continued to make purchases there until now it controls approximately 80 per cent of the land. To ease the hardships of the stricken towns, Los Angeles also has purchased municipal property in the Valley. Farmers—about equal in number to those who were in the Valley when the aqueduct was first conceived—continue to live on the remaining 20 per cent. Los Angeles now controls the entire Owens River watershed, and the residents at present largely depend upon the Southwest metropolis for water. During wet cycles when there is a surplus of water the cry in the Valley is to have more acreages put to the plow. But to such incantations Los Angeles turns a deaf ear. Weather goes in cycles, it is pointed out, and dry years are ahead. The city must be

prepared for such eventualities. The economy of Owens Valley must remain much as it is: controlled and stable.

THE MONO BASIN EXTENSION

Apart from the sociological implications, time has proven that the engineering world was justified in acclaiming this great construction feat. Today, after the lapse of a third of a century, the same aqueduct supplies Los Angeles with most of the water needed. Changes in the conduit have been made here and there and rough edges have been removed so that, at present, the aqueduct is 20 per cent more efficient than it was in 1913.

During the middle 'forties Southern California enjoyed one of its wet cycles and actually had water to throw away in Owens Valley. Much of this surplus was turned to good uses, for instance, to irrigating grazing lands, but much of it was spilled in the long-dry Owens Lake bed. The reappearance of water there invited lawsuits from firms exploiting the chemical deposits in the lake bed. This ironical situation caused Laurence E. Goit, Chief of the Los Angeles Water Bureau to remark in 1945: "There's no peace. First we're sued for drying up Owens Lake; now we're being sued for wetting it up."

The increased capacity of the conduit justified, during the thirsty 'thirties, a 38 million dollar extension into distant Mono Basin, over 7,000 feet above the sea. Once again Los Angeles demonstrated its capacity for doing things in the Gargantuan manner. Engineers bored a tunnel under the mushy 8,000 foot Mono craters, a feat which included the sinking of shafts 900 feet in depth. Desperate battles with carbon dioxide gas and steaming water threatened the lives of a thousand workers engaged in the tunnel construction. At one point, water streamed into the unfinished tunnel at the rate of 20,000 gallons a minute, and it required the use of eighty electrically-driven pumps to keep the hole dry.

In its now completed form the Mono Extension taps the waters of an additional four good-sized Sierra streams. The most northerly of these, Leevining Creek, has its source at Tioga Pass, only ten miles from San Francisco's famed Hetch Hetchy District. "If things get tough," jokingly remarked Wayne W. Wyckoff, affable engineer in charge of the Los Angeles aqueduct, "we may have to bore thru the summit of the Sierras and tap some of San Francisco's water supply." It could be done.

FIG. 7. Colorado River Aqueduct of Metropolitan Water District. Drawn by Ronald Ives.

The Mono Basin Extension has increased the available water supply by 40 per cent, and in its penetration of the Mono Valley, Los Angeles has happily avoided many of the headaches occasioned in the Owens region. Said H. A. Van Norman: "I don't think people in the [Mono] Valley need to be apprehensive. They're going to get a square deal." Even so, the arrival of a Los Angeles City car at the court house in distant Bridgeport, seat of Mono County and about 375 miles from Los Angeles, is viewed with suspicion by the cattle growers. "Wonder what ranch the City is getting this time?" they ask one another. Moreover, historic Mono Lake, like its sister to the south, is drying up, and owners of lake shore property are besieging Los Angeles with complaints that their once beautiful lake view is turning into a blinding white salt flat.

THE METROPOLITAN WATER DISTRICT

Los Angeles has limitless aspirations. It now claims to be the third largest city in the United States and hopes to become the largest. In recent years it and its municipal neighbors (those yet unannexed) have been looking for still newer sources of water to insure future growth. They have found this extra water in the historic rampaging Colorado River.

No less than thirteen cities in Los Angeles and Orange counties pooled their material and political resources and formed the Metro-

politan Water District, secured federal approval and appropriations, and today are the proud possessors of the 242 mile Colorado River Aqueduct fed from Parker Dam.

Ever since Thomas H. Blythe diverted Colorado River water at Palo Verde Valley in 1856—the first recorded use—there had been a multitude of schemes and surveys calling for extensive use of the Colorado River. But not until construction of great Boulder Dam with all its attending compacts and agreements could the Metropolitan Water District, organized in 1928, provide the means for tapping the silted waters of the Colorado.

The project was extremely costly; the issuance of $220,000,000 bonds was authorized by the voters in 1931 and the Depression-born Reconstruction Finance Corporation and Public Works Administration were the obliging federal agencies which made possible the raising of the cash and actual construction of this second great aqueduct.

Once again a construction marvel was performed. In a narrow rock outlet below mighty Boulder Dam, Parker Dam arose and provided for 717,000 acre feet of drinking water. The now completed aqueduct is an amazing network of tunnels—92 miles of them—beautifully lined canals, covered conduits, inverted siphons, reservoirs, power plants, and pumping stations. And into the drinking cups of metropolitan Los Angeles now goes water which has its ultimate source in far distant glaciers of the Wind River region in Wyoming. For the present it would appear that Los Angeles has won its half-century-long fight for water. But if migration to southern California continues at its recent accelerated pace, no one can predict with accuracy how long it will be before the City Fathers will have to look for another miracle man who will be able to keep the faucets from running dry.

THE RACIAL PROBLEM OF SOUTH AFRICA*

RODERICK PEATTIE
Ohio State University

The veld country of South Africa, is indeed, a young country, young not only in its short duration of occupance, but also immature and unsettled in its ways. It is a land where a man can make his own destiny according to his strength and courage, and men of the veld are characterized by eagerness for the struggle and expectancy of victory. All men have certain courses plotted for them by their cultural inheritance and, moreover, men live within the limitations of their environment. But in the veld country European cultural inheritance is largely set aside and the environmental limitations have not yet been met. The veld man on the platteland sits in his saddle as if the world were his servant. Even the businessman is filled with this frontier spirit. And the ever present human conflicts and competition which man cannot avoid are open conflicts. This lecture is about those conflicts. There is the struggle to adapt the veld environment to man's purpose. As one considers the soil erosion and the decreasing fertility of crop land and range, it might seem as if man were losing the battle. But, in addition, it is not yet determined who owns this plains land, who has the right to exploit it. The Bantu invaded the South African veld just ahead of the Boer. And the Boer was not well entrenched before the Briton arrived.

Today, the core land, the veld does not yet have its ownership determined. Generally, very generally speaking, the Boer controls the land while the Briton owns the mineral rights. Most of the consumers' goods are manufactured in factories owned by people of English descent if not actually in factories in England. This is commercial imperialism. The Boer resents the English origin of his goods because he resents past British political imperialism. But we must not forget the Bantu. For altho he lost his first fights for the veld land, he and his non-European allies are numerically superior to Boer and Briton combined, by four to one. He is gaining political wisdom and, once organized, may come to dominate the veld.

Any possible local supremacy of a colored race over the white is

* Presented at the Cleveland meeting of the National Council of Geography Teachers, November, 1949.

frightening to most white people; in the Union much legislation concerning natives is motivated by fear. The leading philosopher of the land, a man with a white beard and a wit not unlike Shaw's, told me that unless Boer and Briton cease their conflicts against each other and join forces, a black fascism in the Union is inevitable. This came not from a reactionary but from a liberal who was active in native social improvement. I got the same opinion from the editor of a leading liberal monthly. Perhaps the country's most important corporation lawyer told me that the wise man will make as much money as possible from the land and will know just the right moment to retreat before the black overthrow of the economic system.

"THERE ARE NO SOUTH AFRICANS"

An intellectual and liberal in the Union has written a stimulating book entitled, *There Are No South Africans*. Essentially he is right. The land is by priority a black man's country. The Hottentots and Bushmen in the southwest were indigenous folk, but there are few pure-blooded members of those groups left and these are of little consequence. The Bantu arrived in the eastern sections not very long before the Dutch and the black migration was still in progress as the Great Trek went eastward. Malays, Chinese, and East Indians were imported into the country, as well as West African slaves. The Afrikaners and the British control the land today. The English say it takes seven years to make a South African. But the English and the Dutch descendants are so distinct that a single South African racial type has not been evolved. Added to the complex are French Huguenots and Germans. But it is a complex and not an alloy. South Africa lacks the melting-pot concept of America. Lastly, there are the refugee Jews. It is in a sense an injustice to say there are no South Africans after remembering the Union's splendid war effort, but there still remains much conflict, too much conflict, among the groups.

In 1936 the population divisions ran:

Bantu	6,596,689
European	2,000,857
Colored	769,661
Asiatics	219,691

The largest group is the Bantu people; tho statistics are quite inaccurate, they form close to 70 per cent of the total. Their rate of increase is notable and probably would be greater if nutrition

were more adequate. To these must be added a considerable number of mine laborers temporarily in the country from states north of the Union. Asiatics form less than 3 per cent and are descendants of indentured labor. All are native to South Africa and natural increase is rapid. Lastly, there are Cape Colored, the Bushmen, the half-breed Hottentots, and the Malays of the Cape. Intermarriage makes differentiation difficult. They form 8 per cent of the totals. The low percentage of Asiatics would seem to relegate their "problem" to a minor place, if it were not for the fact that all non-Europeans are often classed as a group and concessions made to one part must eventually be granted to all. That Europeans are outnumbered four to one is the most significant fact in Union social politics. The answer many seek to this is increased immigration of whites.

The real problem in South Africa is the Bantu, the black man of the veld. They come in contact with the white man in almost frightening numbers in the diamond mines about Kimberley, in the gold mines about the Witwatersrand, as house servants among the people of the cities of the Rand, and as agricultural workers mainly in the Transvaal and the Orange Free State. It is in this last area that the agricultural triangle is found where the Boers raise most of their corn, mealies they call it, and their better cattle. In this area the Bantu does all the physical labor, the Boer is merely a supervisor.

THE BANTU ON THE BOER FARMS

The Boer takes great pride in his cattle and horses, and with reason. But the uncertainty of rainfall has made him unwilling to work with the soil. He underfertilizes, and he is unwilling or unable to buy machinery. There is a fatalism growing out of climatic catastrophe. I wonder, and I am too unlearned to prove, how insidious is the effect of Bantu labor upon the Boer. That the Bantu does the labor—and not with great efficiency—must be undermining to the industry and ambition of the farm owner. I visited the Glen Agricultural College near Bloemfontein and spoke of their training of farmers. They did not, they said, train farmers but overseers. The Bantu farms. The Bantu is not always efficient in his work. Some Europeans on the veld do their own labor, but not many. The Bantu is, to my way of thinking, a certain detriment to farm economics.

The laborer works from sunrise to sundown six or seven days a

week and there are no holidays. But the laborer is slow at his tasks and loafs a good deal. A nine-hour day probably means six real hours of work. The large size of the farms and the scattered dwellings make for much loss of time going to and from work. As wages are ordinarily fixed, there is little incentive for better work. Where a bonus system is introduced, it often fails because of native apathy. A native will frequently prefer to work for a farmer who pays less if the work is easier. Inefficiency and laziness come partly from the diet of mealie meal and separated milk and occasional rations of meat or stolen cattle. The malnutrition is certainly responsible for much disease, especially tuberculosis. The government subsidizes the export of dairy products and eggs, and yet these are desperately needed at home. Natives are fed better in jails than on the farms.

Bantu Labor in the Mines

I have a feeling that in writing about national economics I have at last come to what I know any good Nationalist would call the British problem. In this egocentric age I am sure the British do not consider themselves a problem. It is the barbarians who are problems. In any case it is the British who primarily have developed the mineral resources of the Union. Paul Kruger looked upon gold as a curse and hoped that it would not be discovered. Many a Boer felt the same way. He knew that his quiet evenings in his veld house, with his Bible on his knee, would not survive the greed of a gold rush. Diamonds happened to be found first. But tho the diamond industry has had great value, it has been less important than the gold. Moreover, even considering the relative values of the diamond and gold takes, there have been few Europeans employed and few have shared capitalistically in the returns.

The economics of mining, are dependent upon a cheap black labor. There are almost ten natives for each white man in the mines. This means that except for a few skilled tasks, the whites oversee, while the blacks bend their backs. In gold mining, the European's average wage is some $2,000 a year whereas the native receives perhaps $150 a year and his housing and food—for himself but not his family, who remain in a kraal. The natives' economy is a wage plus housing, food, and medical care, less a deduction for traveling expenses. This, even with the alleged native inefficiency taken into account, is cheap labor. One reason for the natives' being herded

into compounds is that there they can be housed and fed more cheaply than if they lived out. Also, the compounds guard their health and make disciplinary problems less difficult. The cost of transport from the kraals to and from the mines varies and in some cases is excessive. Many of the gold workers come from the Transkei reserve south of the Free State. Their travel expenses take from 15 to 20 per cent of their contract earnings. But the South African points out how much better off the native is now than before this industrial imperialism.

No country in the world has a stranger balance to its economy than the Union. Were it not for the great weight of gold in the credit pan of the scales, South Africa would be a backward agricultural community. At least this is true of the veld land. But gold on the Rand, the very heart of the high veld, alters every economic fact. First, it concentrates white population. In the Union there are various ways of looking at vital statistics. It is significant that 45 per cent of the white population lives in nine cities, of which Johannesburg is by far the largest. But Johannesburg does not stand alone. It merely centers the population of the Rand. There are a score of satellite mining cities within thirty miles of the center of Johannesburg which use that city as a banking, marketing, and general service center.

Actually in the Union one-half of the European population obtains its livelihood from gold and gold mining, and in turn, more than one-half the government funds are derived from gold. The industry has greater stability than agriculture. Always, at the lower moisture limits of tillage, the risk of agriculture gain is great. A good year, a bad year, a total failure. On the veld as compared with the sugar plantations about Durban or the fruit area of the Cape, farming is a gamble. But gold, which actually has no value, is given an artificial one and year in and year out is demanded on a world market. The chief buyers are Great Britain and the United States. Much is bought by the United States thru Great Britain. Theoretically, this gold goes to pay for our machine tools, our automobiles and refrigerators and consumers' goods and gadgets which we sell to the Union. Actually, we are encouraging the South African to send his Bantu workers tremendously deep into the earth to dig out gold. We then bury it again in a rather shallow hole we keep for that purpose in Kentucky.

The agricultural Bantu lives peacefully and essentially happy on the farms; most of them live there permanently with their families. They live primitively and they do not cost the Boer land owner but little. The men who work in the mines are a different case. The diamond mines are essentially not being worked today as the world is overstocked with diamonds and they are closed down in order that the price may be kept up. But the gold mines are working at full blast with Bantu doing the unskilled labor. He is forced to leave his reserves because a money economy has been forced upon him thru unjust taxes. He lives in compounds, without his family. The wife stays at home and farms. It is essentially a system of slavery. But the economy of South Africa is based upon gold production. Gold not only pays its way, but pays for the meager agriculture putting it on a sound basis, and it pays for the cost of government. And the gold production is made possible only thru a cheap native labor. The economy of almost slavery must be kept up in order that the country be kept going.

CONCLUSION

The policy of the country towards the native is ideally stated as "one of continual adjustments of the human relations existing between the civilized and the uncivilized in such a manner as will best insure the steady uplift of the uncivilized without detriment to the standards of the civilized." Under the Smuts regime this policy was progressing to an extent. Under the Malan regime there is a reaction. The native is to be held down from any progress. He is to be treated without any consideration characteristic of the twentieth century. To make no steps towards an amelioration of the native policy is in my estimate to head for disaster. On the other hand, South Africa has recently refused the United Nations on a movement towards racial equality. Actually South Africa has not reached a stage where such is possible but it is regretful that they are not taking steps towards some uplift of the Bantu race.

THE HOP INDUSTRY OF THE PACIFIC COAST

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University of Utah Oregon State College

Since the excellent article on "The Hop Industry of the Pacific Coast States" was written twelve years ago by Dr. Otis W. Freeman,[1] some significant changes have taken place in the relative importance of the producing areas, and in the labor supply necessary for the growing and harvesting of hops. The importance of the change is seen in the fact that during the five-year period from 1940 to 1945, the acreage of hops in Washington increased 205 per cent while the acreage in Oregon decreased by 4 per cent. Production in California has increased by one-third. This article is an attempt to give the new location of the industry and to analyze some of the factors which have made the shift necessary. Ninety-eight per cent of the $40,000,000 worth of hops grown in the United States come from these three states.

Recent additions to our knowledge of the natural requirements of hops have been important in economic production. The hopvine is a long-lived perennial plant usually started by planting cuttings. It grows from six to twenty feet in height by winding itself counterclockwise around a vertical support. The plant has been found to be much like the tobacco plant in that it is greatly influenced by environmental factors. Alluvial soils or deep, gravelly or sandy loams are best suited for hop culture. Good soils are to be found thruout the areas which are devoted to the growing of hops in all of the Pacific Coast states. Much of the land in the Yakima Valley, Washington, however, tends to be lighter or of less clay content than that in the other producing areas and, therefore, better suited to the growing of hops.

The hop plant is extremely sensitive to sun, wind, heat, rain, insects, and diseases. But, when conditions are favorable, it is not uncommon for the vine to grow twelve inches in twenty-four hours. The plant develops best under temperature conditions without sharp and often repeated fluctuations. The temperature should rise slowly and constantly from early spring up to the middle of summer and then gradually and uniformly recede until fall frosts kill the vine. The plant demands an abundance of soil moisture

[1] *Econ. Geog.*, Vol. 12, April, 1936, pages 155-163.

during late spring and early summer (the period of rapid growth). After growth starts, however, cold spring rains are harmful. Excessive moisture in late August and September leads to severe losses from fungus diseases, moldy cones, and plant lice. Downy mildew has caused great damage in the Willamette Valley yards since it was first observed in 1929. Recently, work has been done to develop varieties which are more resistant to this damage, but severe losses still result during wet years. Some success has been achieved by up to twenty-five applications of copper base fungicide. Control of downy mildew has thus been achieved, but is impractical because rains either prevent spraying and dusting or remove the materials from the plants before they have time to be of value. Growers in the Yakima Valley have had greater success in controlling insect pests than farmers in other areas, possibly because of previous experience with control of fruit orchard pests, and sprays or dusts are not washed off in this semiarid locality.

Without sufficient moisture the plant is unable to pick up copious quantities of plant nutrients and growth is retarded with loss of production. Growers in the Yakima Valley are wholly dependent upon irrigation as a source of moisture for the plants, whereas those in other areas depend on irrigation to a lesser extent. In the Willamette Valley of Oregon, the amount of irrigation is small but is increasing.

Fertilization practices vary widely among farmers in the same districts and among different districts. Some growers advocate the use of compost materials exclusively altho production from most of their fields is nominal. In the past up to fourteen tons of barnyard manures per acre were applied. Some growers are still following this method. Recent developments in the use of winter cover crops have proved to be a valuable practice. These crops, which may be any of the winter grains or Austrian winter peas are planted in the fall after harvest and are disced under about the time of the first training of the hop vines, usually during the latter two weeks of April. The use of commercial mineral fertilizers is increasing, with about eighty pounds of available nitrogen per acre being a common rate of application. These are commonly applied in the form of ammonium sulfate or ammonium nitrate. Increasing use of fertilizers in the last few years is one of the factors in the increased yields.

MODERN DEVELOPMENTS IN CAPITAL AND LABOR REQUIREMENTS FOR COMMERCIAL HOP YARDS

During the World War II period with the consequent shortage of labor and high prices, the increase in capital requirements for bringing a hop yard into production has been tremendous. It is estimated in the Yakima Valley that about $700 per acre is now the average cost for labor, plants, wire, poles, twine, etc. In California, estimates range from $750 to $1000 per acre for establishing a hop field, exclusive of land costs. The result has been that relatively few new yards have been started except in proven areas and even there the increase has been more in acreage of already existing fields rather than in number of farms.

Changes in the labor requirements have also been drastic. Cultivation is now largely mechanized, but training of the vines to grow on the trellis wires and the cutting of all except two or three vines per hill remain hand operations.

In 1936, harvest costs made up 46 per cent of the cost of production. Prior to the war period, most of the picking of hops was

FIG. 1. Two portable hop pickers in operation. With a crew of eight to ten men, each machine will harvest from 15,000 to 20,000 pounds of hops in ten hours. A 90 per cent reduction in harvest personnel is thus effected, as this poundage would normally require about 100 workers. Lights make night operation possible. (Photograph by courtesy of Yakima Chamber of Commerce)

done by hand and was a rather slow process. Eight men and a portable hop picking machine (Fig. 1) can now do the work that formerly required the efforts of two hundred men. The hop picking machines are of two types: the portable machine which is pulled thru the field, and the stationary machine to which the hops must be hauled. In the first case, two men riding on the front of the machine cut down the hop vines as the picker moves down the row. With the stationary picker the vines must be cut down and hauled to the machine. In the Yakima Valley, at least 98 per cent of the hops are mechanically picked. About half of the yield is harvested with the stationary picker, half with the portable picker. Until 1946, use of mechanical pickers had resulted in a larger amount of foreign matter with the hop cones. At that time, a prominent Yakima grower invented a "jigger" which produces a cleaner product than hand picking, and cleaner than any crop previously produced in the United States. Foreign matter in 6,700 bales of hops tested by the United States Department of Agriculture was 4.96 per cent as compared to 10 per cent in 1945. It is possible that this may be a factor in retaining our markets, even after production is renewed abroad. By terms of a reciprocal trade agreement with Czechoslovakia in 1947, tariff duties on hops selling for 50¢ a pound were reduced from 24¢ per pound to 12¢ per pound, altho protested by the Hop Growers Association.

In the Sacramento area of California, the percentage of hops picked by machine is about the same as it is in the Yakima Valley (98 per cent). In Sonoma and Mendocino counties of Northern Coastal California about 60 per cent is picked by machine, while in the Willamette Valley of Oregon only 25 per cent is harvested by this method. Reason for the differences lies in the size of the individual farms in each area and the income of the farmers. Hop yards in Oregon are generally smaller than those in other areas and because the yield per acre is less, many farmers cannot afford to invest so much money in a machine. The portable pickers cost about $8,000 while the stationary machines sell for about $20,000. The stationary machines have several times the capacity of the former, but the trend is toward the use of the cheaper machines. Where hand labor is still used, it is generally migratory. Ordinarily, workers prefer fruit picking, which comes at the same time, because it is cleaner work.

Changes in the curing of hops have been few. These changes have been in the shift to oil as a source of heat and the increasing

use of fans and forced circulation of the warm air used in curing. The result is faster and more uniform cooling with less loss from scorching or undercuring. More rapid curing at less cost also results, the air need not be heated to such high temperatures, and a kiln can handle more hops than with natural draft kilns. Regions in which the air has a low humidity during September make for cheaper and faster drying. The Yakima Valley has a distinct advantage in this respect. After curing, the hops are stored for one to three weeks, then pressed and wrapped in burlap for shipping.

USES OF THE HOPS

Technically, the hop plant is grown for its cones (hops) containing lupulin, consisting of resins and essential oils, which impart the characteristic flavor to beer, ale, and other malt beverages. The essential oil also contributes to the keeping qualities and aroma of beverages and the tannins occurring in the scales of the hop cone or strobile aid in the clarification of the brew after boiling.

Only a very small amount of dried cones is needed in the making of beverages. Thus in the United States, each thirty-one gallon barrel of beer requires the addition of about a half pound of hops. In foreign countries the amount used may be up to one and a quarter pounds per barrel. According to the former figure, about 42,000,000 pounds of hops would be consumed in the United States per year by the breweries which represent approximately 98 per cent of the total usage. Other uses include the flavoring of foods, cereals, base for pills, yeast, and fixative for dyes. Brewing companies disagree as to the quality of hops produced in the different states, some having preference for hops from one state, others prefer hops from other states and some make no preference. Some find greater variation from the same area from season-to-season than the variation among different areas. Breweries vary considerably also in the amount of European hops purchased (in the prewar period). Some breweries use no European hops, others used up to 30 per cent from Europe. Since the war, United States hops have been exported to Europe, but production there has been increased almost to the point of self-sufficiency.

PRODUCING AREAS

Three major hop producing areas are to be found in the West Coast States. (See maps.) These are the Yakima Valley of South

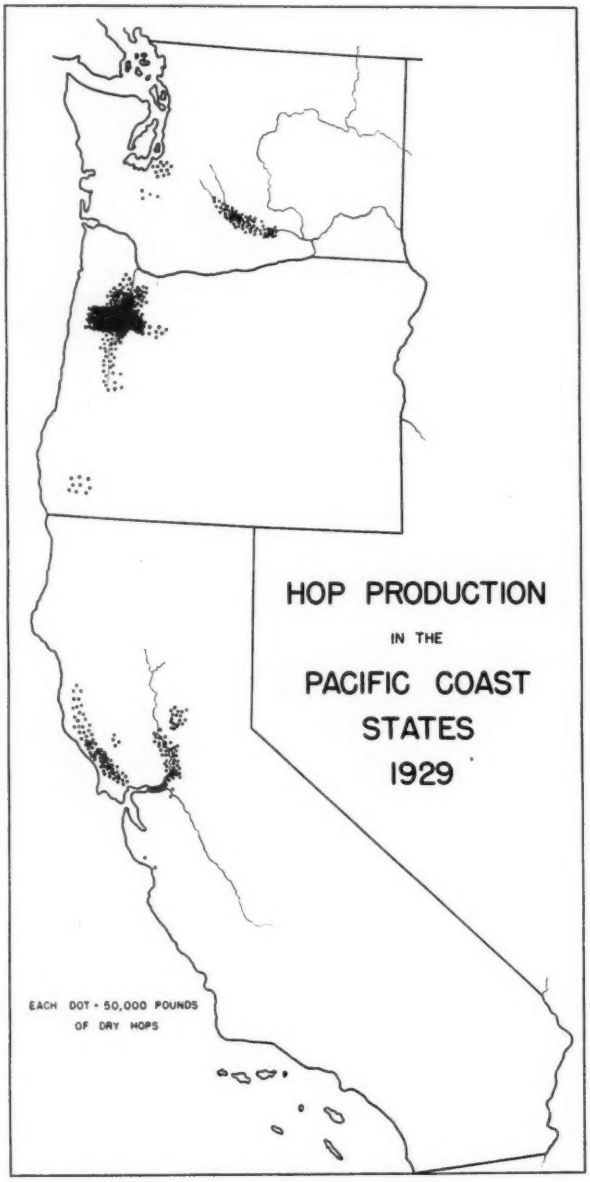

HOP PRODUCTION
IN THE
PACIFIC COAST
STATES
1929
EACH DOT - 50,000 POUNDS
OF DRY HOPS

FIG. 2.

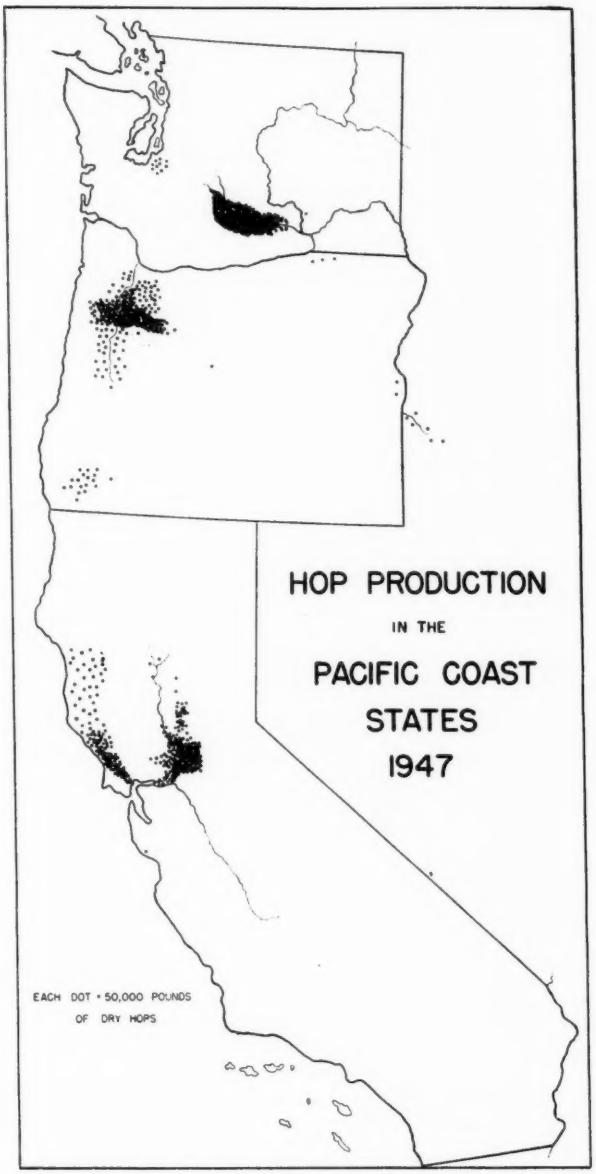

HOP PRODUCTION
IN THE
PACIFIC COAST
STATES
1947
EACH DOT = 50,000 POUNDS
OF DRY HOPS

FIG. 3.

Central Washington, the Willamette Valley of Western Oregon, and the central part of California. Minor producing areas of the United States include the Snake River Valley of Idaho, the Puget Sound Lowland near Tacoma, Washington, scattered areas in Eastern Oregon, and parts of Central New York. The Yakima Valley region is the most important of these areas and is the one

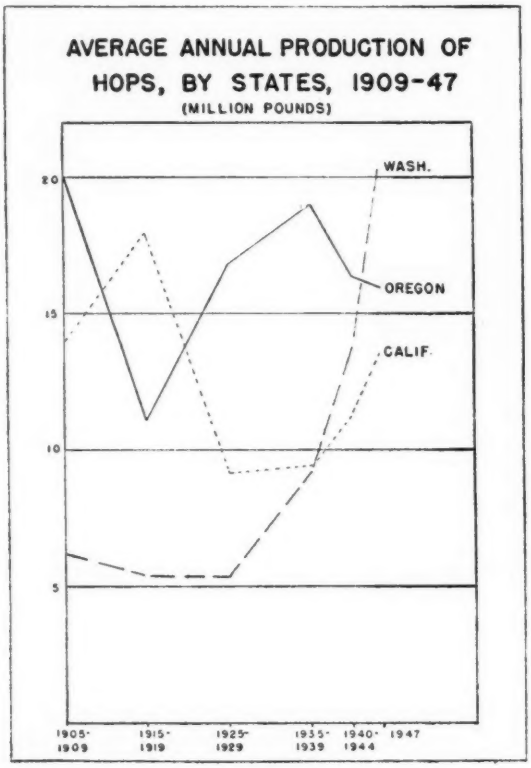


FIG. 4.

which has been showing the most rapid growth in recent years (see table of statistics).

In the Yakima Valley, most of the hops are concentrated in four districts: around Moxee City, a few miles east of the city of Yakima; the Tampico district about twenty-five miles west of Yakima; the Indian Reservation-Mabton district about thirty miles south of the city of Yakima; and the Sunnyside-Prosser district about fifty miles southeast of Yakima. The first two are older but the latter two have the largest yards, some up to 1,000 acres in size. About one-third of the crop is produced under the guidance

of the Washington State Hop Grower's Association organized in 1937. A standard quality for the crop and numerous publications and advice on the factors of growing and marketing hops make the cooperative successful.

The valley of the Willamette River in Western Oregon is the second most important producing area. Hops occupy the present floodplain thruout the length of the river valley on Newberg and Chehalis soils. These are the best soils of the lowlands but are relatively heavy. The greatest concentration of yards is to be found immediately west of Salem. In addition, there are many small yards scattered thru the lower foothills of the valley side of the Coast Ranges. These are mainly on the Olympic series of soils formed from the breakdown of lava, which are the better hill soils. These yards are usually the lowest producing in Oregon. The acreage of hops in Oregon is 62 per cent more than that of Washington but the production is 26 per cent less, due to lower per acre yields (Fig. 4).

The hop land of California is found in the southern part of the Sacramento River Valley and along the coast north of San Francisco. The alluvial soils at the confluence of the Sacramento and American rivers and of the Yuba and Feather rivers are areas of heavy concentration. A very small amount is grown south of San Francisco in Santa Cruz County. However, the heat received from the summer sun is too great as one goes south of this area. Wide variations in practices, yields, and diseases are to be seen in the producing areas. In general, the Sacramento Valley areas follow practices similar to those of Eastern Washington and Oregon while the coastal areas are similar to those of the Willamette Valley. Irrigation is common in interior fields; seldom seen in coastal hopyards. Yields are high in the Sacramento Valley area; lower in the coastal districts. Seeded hops are grown in the coastal districts, but seedless cones are more common in the interior.

Other areas which produce hops are found in the Puget Sound Lowland near Tacoma, Washington, where practices, yields, varieties, diseases, etc., are similar to those of the Willamette Valley. The Snake River Valley of Idaho produces a small amount of hops near Twin Falls using irrigation as a source of water. The arid conditions are typical of the Yakima Valley hop yards. Eastern Oregon has a number of small districts which produce hops most of which are only a few tens of acres in extent. Moisture is supplied by irrigation and while these districts are in Oregon they

are more typical of the Yakima Valley farms than of the western Oregon hop yards. These are the only parts of Oregon where planting is exceeding the acreage plowed each year. Southwestern Oregon has a small acreage along the Rogue River, where conditions are similar to those along the Willamette River. New York, formerly an important producer, steadily declined until 1940 and is now a very minor producing area. Poor climatic conditions such as sharp variations in temperature and cold rains make this area unsuited to the production of hops. The following table shows acreage, production, and yield in 1947. Indications are that the production was about the same in 1948, but the acreage was slightly larger.

State	*1947 Acreage*		*1947 Production in Pounds*		*Average Yield Per Acre*
California	9,017		13,590,000		1,507
Coastal Calif.		3,929		5,300,000	1,425
Sacramento Valley		5,000		8,300,000	1,660
Oregon	19,185		16,045,200		836
Willamette Valley		17,210		13,551,200	787
Eastern Oregon		309		540,500	1,102
S. Western Oregon		1,666		2,153,500	1,292
Washington	11,894		20,402,000		1,715
Yakima Valley		11,537		19,892,000	1,724
Western Washington		357		510,000	1,429
Idaho	245		390,700		1,595
New York	300		215,600		719
Total United States	40,641		50,653,500		

FACTORS IN THE VARIATION IN YIELDS OF HOP YARDS

It is difficult to assign relative values to the many factors involved which give the Willamette Valley hop yards smaller per acre yield than other areas. The average yield in California is only slightly less than that of South Central Washington. Many interrelated elements must be analyzed to obtain the total picture. Of great importance are the physical factors of soil and climate. In the hop growing regions of Western Oregon, the coastal parts of California, and the Puget Sound Lowland of Washington, hops commonly occupy soils which are not particularly adapted to their needs. They may be heavy, difficult to work, of rather high clay content, and have a dense, compact subsoil. Sandy to gravelly loam is practically demanded by the deep rooted hop vine if optimum growth is to be received. Soils occupied by hops in Yakima and Benton counties are of the Sagemoor Series and are the best

FIG. 5. Cultivating one of the hop yards in the Yakima Valley. Note the depth at which these small tractors can pull the implements. This indicates the light, sandy character of the soil. The vines have reached the tops of the twenty-foot trellises by this date, approximately May 1. (Photograph by courtesy of Yakima Chamber of Commerce)

in the valley from the standpoint of texture, fertility, drainage, and slope (Fig. 5). Thus, the Yakima Valley hop plant is better cared for from the ground up.

Climatic conditions in South Central Washington and the Central Valley of California are also favorable not only for plant growth but for the prevention of yield reducing diseases and plant insects. Most important of these are plant lice and downy mildew which causes serious losses in some areas during cool wet years. Cool temperatures and humid conditions favor the spread of downy mildew and are major reasons why the Willamette Valley has a greater incidence of this disease than other areas. On the other hand, the hot, dry summers of South Central Washington

prevent the formation of downy mildew, and the cold, dry winters help to prevent the increase of destructive insects. Moisture requirements of the hop vine during the spring and early summer are exacting and are met in the Yakima Valley by irrigation. Some growers of the Willamette Valley practice irrigation, but the number is not large. Besides this, the type of irrigation used in the Willamette Valley seems least fitted to the humid conditions found there. Altho it is true that the summers are dry, nevertheless, the humidity is greater here than in the interior regions. In the interior areas of both Washington and Oregon, ditch irrigation is more commonly used, while in the coastal region, sprinkling is common. The use is directly related to the fact that undulating land is more commonly planted to hops in the coastal regions while gently sloping lands are used in the interior. It is also related to the time at which irrigation was first practiced in the region. Sprinkling is a relatively new method of field irrigation, and the use of supplemental water as a crop aid is a recent innovation in these humid regions. Most of the yards in the Willamette Valley were established before the practice of irrigation was begun, so few fields are leveled. Sprinkler irrigation in moist regions has a tendency to further the spread of downy mildew, particularly if growers are careless and irrigate on cool, cloudy days, because it increases humidity within a small area. Irrigation also makes heavier fertilization possible because plants can take up larger amounts of plant nutrients without being "burned up." The fertilizers are diluted by large quantities of water to a strength the plant can withstand. This, of course, makes more rapid and vigorous growth of the hop vines and therefore greater production. Farmers vary widely in the amount and kind of fertilizer that they use. In areas of low production and high possibility of loss from disease, farmers are loath to spend large amounts of money for fertilizer. The result is a lowered yield.

Other factors in the increased yield of some areas are related to planting. Because of warm early-spring temperatures, the lack of cold rains, and the benefits derived from irrigation in South Central Washington and parts of California, hop vines may be set out so early and grow so rapidly as to yield a moderate crop the first year. The Sick's Brewery Enterprise Yard at Sunnyside, Washington, reported that it harvested 2,020 pounds per acre during the first year from thirty-six acres planted to hops in

1947. In Oregon yards, frequently no crop is obtained the first year and only a partial crop the second. This adds to the expense of establishing the hop yards and decreases the average yield for the state. This factor of production during the first year is extremely important when we consider that about 2,000 acres of hops were planted in the Yakima Valley in 1947 and about 1,150 acres in 1948.

The spacing of plants in the row is another planting factor which has a diverse effect on yields. Differences are found from field to field in the distances between the rows and between the plants within the row. Seven by seven feet is the usual spacing in irrigated fields, altho "double planting" (three and a half feet in the row) is sometimes practiced, especially in California. In areas which depend upon rainfall, eight by eight feet planting is more common. Thus there is a loss of about 240 plants (or 25 per cent) per acre resulting in a lowered yield.

Human and economic factors also have an important effect on yields. With low yields and great possibilities of loss from diseases and parasites, the Willamette Valley farmer often hesitates to spend money and labor on field practices which may not show a profit. The small size of the average hop yard often makes it impossible to buy the latest equipment and follow the latest methods. In 1947, about 65 per cent of the Willamette Valley hop yards contained less than twenty-five acres and 85 per cent contained less than fifty acres. In the Willamette Valley a small hop yard is frequently a phase of diversification on a larger farm. Thus it doesn't receive the grower's full attention. On the other hand the growers in the Yakima Valley and Sacramento Valley are generally specializing in hop production. (Fig. 6)

Oregon growers frequently receive lower prices per pound for hops grown than do farmers of other areas. This is mainly due to two factors. First, poorer quality of the hops due to lack of equipment for recleaning and lack of modern kiln driers with consequent uneven curing. Secondly, and more important, the practice of growing "seeded hops." The hop plant may be either male or female. If only female plants are grown in the yard, the cones remain unfertilized and seeds do not develop within the "hops" or cones. Hops which contain seeds weigh more, but have a higher tannin content and are less valuable for brewing. For this reason, prices for seedless hops were 75¢ per pound (cured weight) while

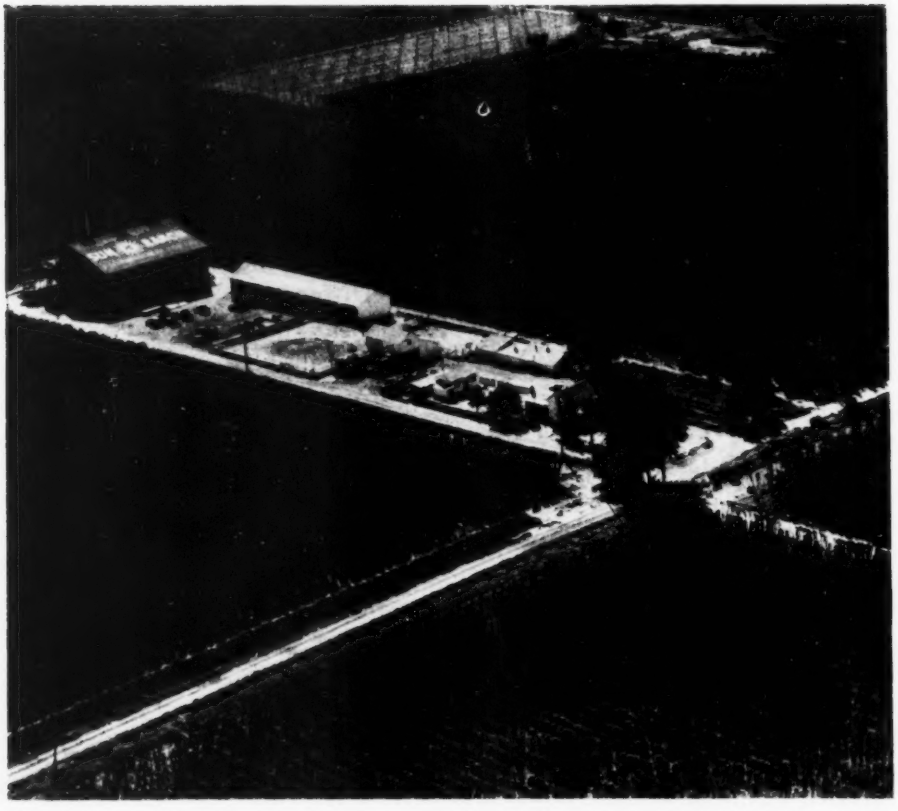


FIG. 6. One of the large hop farms in the Yakima Valley. The light-colored area in the background has been harvested. The large building at the left is the drying shed. Note fan vents in the roof. (Photograph by courtesy of Yakima Chamber of Commerce)

seeded hops were selling for 65¢ per pound during the fall of 1947. In 1947, about 72 per cent of the hops grown in Washington showed less than 6 per cent seeds while 65 per cent of the California crop and only 15 per cent of the Oregon crop showed the same degree of purity. Because of the already low yield per acre, the Oregon grower hesitates to decrease the weight of the crop still further by growing seedless hops. These factors of yield and price made it possible for the Yakima Valley or Sacramento Valley grower to gross about $750 per acre more than the Willamette Valley grower.

CONCLUSIONS AND SUMMARY

What picture of the possible future of the growing of hops in the Pacific Coast States do these facts give us? What are the

chances of these states to maintain production at present levels? Any one of them could supply the market needs of the breweries of the United States provided it would plant all of the suitable area in hops. Therefore, the hop grower must be continually careful to keep his costs within the lowest possible range and to produce the largest yields so his cost per pound will be as low as possible. Few farm enterprises show such a high percentage of cash cost as does hop growing. For this reason and because the European markets will undoubtedly soon be lost to the United States, the hop growers should be very careful not to overplant. Each farmer must keep an accurate acccounting of his costs and if they are high, he will have to change his methods or turn to some other type of farming. The amount of hops used per barrel of beer is gradually decreasing in the United States. Thus we shall see a gradual decrease in the acreage of hops within the areas with a low yield and a gradual increase or maintenance of present acreage in places where hops can be grown at low cost. Beer consumption tends to rise and fall with national income; from 1940 to 1945, it rose from 13 to 19 gallons per capita, almost 50 per cent. Unless consumer purchasing power is maintained close to its wartime level, per capita beer consumption is likely to decline.

The factors of climate, soils, irrigation, distance of planting, yield during the first year, diseases and insect pests, variety, use of fertilizer, methods of harvesting and curing, and size of farms, all conjure to make it more difficult for the Willamette Valley farmer to compete with the California or Yakima Valley hop growers. The process that has been going on for the past ten years of decreasing production in the coastal areas will undoubtedly continue. If untaxed imports from foreign countries are allowed or if there is another period of depression, the high-cost, low-yielding farms of these coastal areas will find it increasingly difficult to continue to compete with the high-yield, low-cost areas of the interior and will undoubtedly discontinue producing hops.

MEXICAN MERCADOS

MINNIE B. TRACEY
Drake University, Des Moines, Iowa

FUNCTION OF THE MERCADO

The Mexican mercado is the counterpart of the American farmers' market or the municipal market. In general, there is a central building in which are housed some of the more perishable items, and from this stems the market itself, its various ramifications protected from the sun and the elements by canvas topping. In the city, the market may extend for several blocks, lining both sides of the street. To get a full view of what is being offered, one walks down the middle of the street. In the village, the market is a miniature of the city one, but it is ever present.

In the United States, the farmer brings in his surplus produce and rents a stall from which to dispose of it. At the same time, regular merchants may have counters from which they sell meats, fruits, flowers and potted plants, and other items similar to those they sell in their regular establishments. The situation may be similar in the Mexican market, there being a great diversity of goods offered, many of them manufactured goods.

Selling here is likely to be a family affair, the mother caring for her small children while she sells—with the cat or the dog much in evidence. A certain amount of "socializing" among neighbors and friends is inevitable, altho the market is quite definitely a means of disposing of surplus or of articles produced expressly for sale.

It is here that the masses of the people do their shopping. While there are department stores and specialty shops in the towns or cities, these tend to carry merchandise of greater quality appeal, goods which the lower income groups cannot afford. The mercado on the other hand, carries practically everything that the average Mexican homemaker would use.

DEPARTMENTALIZATION

The mercado is rather loosely departmentized. Ordinarily there may be found the following departments: (1) foods—fresh fruits, fresh vegetables, meats, fish, poultry, food preparation and restaurants; (2) flowers; (3) basketry and/or pottery; (4) clothing—blouses, house or street dresses, children's wear, shoes; (5)

miscellaneous items—jewelry, combs, household utensils, hardware, even some plumbing fixtures and furniture.

PRODUCTS SOLD

What amazes one in this land of both riches and poverty and need, is the abundance of foods and other items found in the markets. It is distressing to see the vast quantities of over-ripe bananas and other fruits, knowing that so many families have too few pesos to make possible quantity purchases. Many of the Mexicans, however, may not be too unhappy over this aspect of their plight. Tradition binds the country folks largely to a diet of tortillas, frijoles, and chili, even in the fruit and vegetable producing regions—highly nutritious according to the dietitians. Nevertheless, the large city markets offer fruits and vegetables in great variety. Among them may be seen many greens, many types of chili, several types of dried beans, string beans, carrots, radishes—some of enormous size—garlic, tomatoes, beets, peas, avocados, cabbage, potatoes, tuna (fruit of a cactus plant), apples, strawberries, pineapple, bananas, grapes, mangoes, pomegranates, coconuts, melons. Most of these are Mexican grown, but in the city some of the crates bear United States labels.

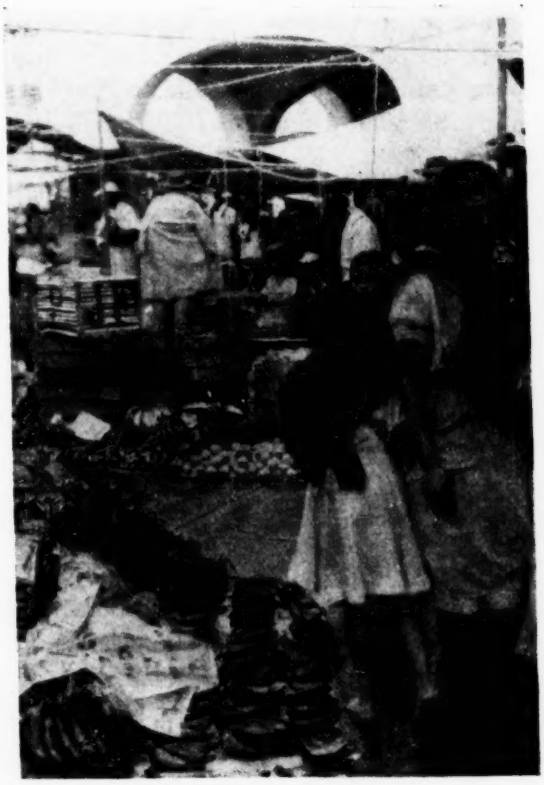


FIG. 1. Market in Acapulco.

Flower markets are sometimes separate, occupying stalls on a different street as in Guadalajara, for example. They may be entirely separate, as the funeral wreath and some of the other flower markets in Mexico City, or they may occupy a department in the

general market. In any case, the flowers are varied, profuse, and beautiful—as well as very inexpensive according to our standards. It is possible to buy a lovely corsage for as little as one peso—roses for three cents in our money.

In the various clothing departments are to be found, for the most part, items for the working man or dresses for the woman in the home. Usually there are also blouses brought in from the surrounding villages. These are hand made, some of them lavishly embroidered. These, as well as the dresses, are not particularly well fitted to the American figure and in the summer of 1948 the new lengths in dresses had not yet invaded these markets. Aprons and other hand-made articles are equally attractive and relatively inexpensive. Altho an apron in the Mexico City markets might cost as much as six pesos, a beautiful apron trimmed with crocheted medallions might be purchased in the Guadalajara market for as little as three pesos. Children's clothing, especially that for little girls, is very attractive and very reasonable in price.

Geographic Influence on Offerings

The specialties of the markets are largely dependent upon two factors—the geography of the region and the character of the trade. Altho food products of many types may be transported to the large city markets, other items tend to be characteristic of the region. There is much pottery in Taxco, Xochimilco, and Uruapan, and very much in Guadalajara. The Cuernavaca market has a scarcity of dresses, blouses, and flowers. Toluca, being west of Mexico City, has few tropical fruits. Lacquer ware appears in the market in Uruapan; however, it is of a grade inferior to that to be found in the shops in that city. Yard goods is greatly in evidence in many of the markets, particularly in Toluca and Guadalajara, where there are few ready-made garments.

Tourist Influence on Markets

The type of customer exerts much influence on the items offered for sale. Whether the market caters to tourists largely or whether it sells articles mainly for home consumption has much bearing both on the goods offered and on the sales tactics employed. Absence of bright serapes, baskets, blouses and jackets leads to the observation that the markets in the little towns and villages and in the non-tourist centers like Jalapa are maintained mainly for the benefit of the local residents.

Toluca, a world-famous tourist market, has a whole department devoted to baskets and basketry. It has many lace doilies and much drawn work, hand-embroidered jackets, blouses, aprons, dresses and baby dresses. Vendors here are most persistent. They greet the tourist as he descends from the bus or car, present their

FIG. 2. Part of Toluca market.

baskets or purses and refuse to take "No quiero" for an answer.

Often the mercado itself emphasizes goods for home consumption while the arcade markets surrounding the zocalo or central plaza of the town strive avidly for tourist trade. Vendors literally pursue their prospects, note whether or not they buy, and approach them again at next sight. In Puebla, while the writer was dining in a hotel restaurant, a vendor who had thus "become acquainted" stood outside the window waving a lovely maguey-fiber table cloth up and down, much to her amusement. He thus attracted attention and created interest. A meeting outside might have aroused desire and resulted in a purchase. However, he failed to clinch this sale. At the end of the meal our erstwhile salesman was not waiting without; rather he was slumped down in front of his stall in the typical sleeping-man position indulging in his afternoon siesta.

While vendors in the general markets, since their wares are sold largely for home consumption, may not be so insistent upon making sales, those in the arcades and along the streets are quite the opposite in their approach. They are accustomed to meeting

tourists and thus find themselves in the position of the one-stop salesman. It is a case of selling to that customer now or not at all; hence every effort is bent toward effecting a sale, even to the extent of annoying the prospect.

Atmosphere

The atmosphere of all of the markets is colorful and interesting. The odor is difficult to describe; it is an intermingling of smells of vegetables and fruits, tropical and non-tropical, usually pervaded by the sickly-sweet scent of the lime. Move toward the fish or meat department, however, and this is dissipated by their more characteristic and less agreeable odors. Meats are strung up in unrecognizable cuts, almost always without benefit of refrigeration. Sliced pineapple may be sold from a block in a would-be aisle with its full complement of flies or even of bees.

Look in vain for bobby pins in the stores, only to find them on the miscellaneous counter in the market—in the bulk. Buy your toothbrush here all exposed to the elements. Now make way for someone coming thru with an armful of chickens, then for someone else with turkeys. Or stop to look at the sandal-clad Indians with their panchos or rebozos and wide straw hats. If they have purchased a new hat today, the new one will be atop the old one. Notice the life-sized straw man modeling workmen's apparel.

Peep into the kettles of soup or chicken or watch the tortillas frying over a charcoal blaze—to be eaten in the hole-in-the-wall restaurant conducted in connection with the market. And do not fail to see the dogs, cats, and chickens roaming among the foods and dry goods. See, too, that the crowd moves on, paying scant attention to the rare refrigerator case of pasteurized butter and cheese, or to the oddity of a fly-netted fruit display.

The Mercado as a Marketing Institution

The mercado, whether it be the great San Juan or Lagunella market in Mexico City or whether it be the market place in the most remote village, is a well-established and permanent marketing institution. It is the department store of the common people. It also serves the more fortunate classes so far as some departments are concerned. Usually one or two days a week are designated as market days, at which time the housewife may stock up for several days. On these days the markets are crowded, as are our farmers' markets on their particular days, with people buying everything from food to plumbing fixtures.

WESTERN GERMANY

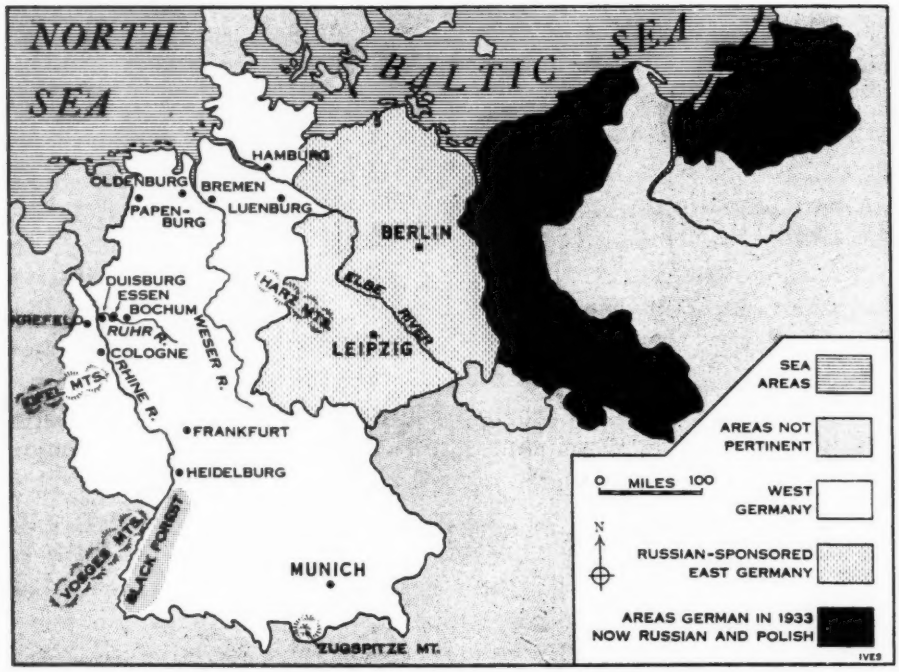
ADOLPH STONE
Long Beach City College

A new member of the family of nations, as the name already indicates, covers the western 100,000 square miles of the original 180,000 square miles of German land. While this is only about two-thirds of California, it is still a respectable size for European conditions (Great Britain has only 93,000 square miles). And in population the new "Reich" will probably out-number again all other European countries, but not by the wide margin of prewar days. By counting all repatriates (Western) Germany will have near to 50 million people compared with 64 million before the war, 42 million Frenchmen, 47 million Englishmen and 24 million Poles. With the exception of Berlin, the now divided capital, and of Leipzig, a probable center of an Eastern Germany, all large cities of the prewar Reich are in the western part, such as Hamburg, Munich, Cologne, Essen, Frankfurt, and others. This makes Western Germany a strongly urbanized state with a population density of almost 500 people to a square mile. With this equation—people versus area—in mind, the geographer should reevaluate the geographic picture.

Munich, Germany's most southern city, has the same latitude as our most northern Seattle (48°N.). The climate of Western Germany is mild. The marine influence from the North Sea penetrates the country all the way to the eastern and the southern boundaries, the fringes of the Alps. In contrast the climatically less favorable "hinterland" of the Baltic Sea remains in the Russian zone of influence. With almost nine months growing season, with an average of 65° to 70° in summer and with 10° to 20° in winter, with sufficient humidity to make irrigation unknown (30 to 40 inches of rain), without strong storms or floods, Western Germany's climate is stimulating and explanatory of much of the energy shown by the peoples of that area thruout history. Some professional men will compare Oregon's climate with it, yet I have actually not found any one area in the United States, which climatically compares with Central Europe.

In contrast to the good climate Western Germany's soils are somewhat less than mediocre. In its northern part, as the result of glaciation, there are extensive sandy areas, large stretches of heath around Lueneburg and marshes extending from Papenburg to Oldenburg (where much concentration camp labor was employed

in drainage projects). The center of the new country shows the irregular pattern of low uplands, from the Harz to the Eifel, cut up by the systems of three big rivers, Elbe, Weser, Rhine, and the south gradually rises to the heights of the Bavarian Alps (Zugspitze, 9700 feet). The Rhine valley is paralleled by highlands on both sides—Vosges and Black Forest—which makes it the land of



romantic scenery, famous with wine and song (Heidelberg, Ruedesheim, etc.). The overall picture for Western Germany's agriculture is not very bright. Prewar Germany, as is well known, reached almost self sufficiency in food production only with much cultivation, fertilization, regulation, all of which was high cost farming needing government help. The working population therefore depended largely on staples, such as rye and potatoes, which came from the estates of the Junkers in the cooler Eastern Germany, now taken over by Russia and by Poland. If Western Germany cannot restore the traditional exchange of East German farm products for its industrial goods, it will have to turn to its western neighbors. The result could be war diminishing interdependence, the basic idea of the Marshall plan. While rye, as already mentioned, is mostly grown in the short summer areas of the eastern part of the country on large farms, Western Germany has almost exclusively

small farms broken up into wheat, barley, beet and feed patches with some dairy and some meat animals.

The supplementary fishing is strongly curtailed by the lack of vessels and the lumber or steel with which to build them. Large cultivated forests, one-fourth of the land area, were decimated for army use during the war, and for fuel for a freezing population by the occupation authorities right after the war.

Western Germany's industrial assets, more than anything else, seem to be the reason for the speedy creation of the new state. Correctly it has been stated that Europe cannot recuperate without the German coal and steel. Half of Europe's coal and even more than half of the coking coal, so important for steel production comes from the Ruhr mines (Essen, Krefeld, Duisburg, Bochum, etc.). Two other former German mining areas, Silesia with coal, and Saxonia-Thuringia with lignite, are now Polish and Eastern German respectively. With almost 90 per cent of the prewar coal reserves left in Western Germany, with rich potash deposits and with some low-grade iron mined along the Rhine and in the central uplands, but minus all other mineral wealth, the new state will have to struggle to reach prewar figures in the production of pig iron, raw steel, chemicals, textiles, motor vehicles, appliances, etc. Since almost 50 million out of 64 million Germans choose to live in Western Germany, the employment problem will be most difficult. Future industrial development will depend on the skill of German workers, especially miners and on other factors such as markets and transportation.

Western Germany has an excellent river-net especially in the Rhine and its tributaries of which one is the Ruhr. Many canals connect the rivers. Roads, like the Autobahnen, and railroads are also good except for war damages which are being repaired. Bremen and Hamburg are world renowned harbors, second only to New York and London. Rolling stock and even more so water carriers are badly depleted as a result of the war. Another severe handicap is the Iron Curtain cutting thru German land, roads, railroads, rivers, and forming the new state's eastern boundary, while the western boundary, in all probability, will be the old German frontier. On the asset side again is the loss of much Prussianism. A map comparison of this youngest Reich with the medieval, pre-Hohenzollern (first) Reich will show surprising similarities.

Whatever our feelings might be, in the interest of peace we must wish the newest member of the family of nations well.

THE NATIONAL COUNCIL AT WORK

Two committees of the National Council of Geography Teachers have recently sent letters to all of the State Coordinators, the State Superintendents of Public Instruction, to many geographers and geography departments, and to school officials in all parts of the United States.

The Committee on the Promotion of Field and Travel Experiences for Teachers has (1) organized a tentative list of aids toward travel and study experience, (2) divided responsibilities among themselves as to work on (a) field experiences, (b) travel and teacher exchange, and (c) hospitality for foreign geographers, (3) prepared materials relating to travel and field trips, and (4) conducted a sectional meeting on Field Experiences at the 1948 meeting of the National Council in Chicago. The committee distributed material to the State Coordinators at the Cleveland meeting in 1949. Members of the committee have consulted in Washington with the United States Office of Education, the National Education Association, the State Department and the Pan-American Union. Contacts with visiting foreign geographers have been made thru UNESCO and the Institute of International Education.

A letter, listing some fifteen geography field trips scheduled by colleges and universities for the summer of 1950, was mailed to two hundred educators on January 10. *The committee chairman asks all geography departments to send her announcements of 1950 field trips* as soon as possible. Educational travel has become so well accepted that N.E.A. has scheduled a special series of meetings relating to this field at the forthcoming Atlantic City meeting in February, 1950. This active committee of the National Council consists of Pauline P. Schwartz, New Haven State Teachers College, New Haven, Connecticut, *Chairman*, Adah Flemington, New Trier High School, Winnetka, Illinois, Paul H. Kensel, Travel Service, National Education Association, Washington, D.C., G. Etzel Pearcy, Transworld Airlines, and A. W. Watterson, Illinois State Normal University, Bloomington.

The Committee on Compilation of Suggestions and Bibliography for Use by Curriculum Committees mailed letters on January 5 to all state superintendents. This committee is gathering the lists of State Courses of Study and State Bulletins, and preparing a bibliography of articles pertaining to curriculums in geography. Each superintendent was notified of the name of the NCGT State Coordinator in his state, and later more detailed work will be carried on thru the Coordinator. The Committee has completed work on an annotated bibliography of articles dealing with geography curriculums that were published in the JOURNAL OF GEOGRAPHY during the period 1939-1949. This bibliography is divided into sections on the elementary grades, Junior High School, and Senior High School. The members of the committee are Mamie L. Anderzhon, Oak Park Public Schools, Illinois, *Chairman*, Mrs. Annice D. Elkins, Supervisor of Instruction, Osceola County, Kissimmee, Florida, Monica Kush, University of Illinois (Navy Pier School, Chicago), and Villa B. Smith, John Jay High School, Cleveland, Ohio.

LOYAL DURAND, JR.
President

EDITORIAL NOTES AND NEWS

In 1946, the NCGT initiated a Contributing Membership, a class of membership in which there has been a steady growth with every passing year. Contributing Memberships are renewable annually. Dues are ten dollars. This sum includes the regular membership dues and the JOURNAL OF GEOGRAPHY, with the remainder of the money going into the publication and general funds.

It is by the continued building up of this type of membership that NCGT can make further progress. This group can never grow too large in numbers. Add your support to the furthering of geographic education.

The 1949 list of Contributing Members were:

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Wallace W. Atwood, Sr.*
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Katheryne T. Whittemore
Ruth Wood
Lillian Worley
Rose Zeller
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* Deceased

Into how many major phases would you divide the experimental work since 1900 on the problem of teaching geography in the United States. Professor N. V. Scarfe recognizes that in the British Isles since 1900 three major phases of experimental work exist. The three are: 1) "It was not until 1919 that controlled experiments were made with follow-up tests;" 2) "The second phase of experimental work which developed mainly after 1920 was that of investigation into scientific geographical abilities and achievement;" and 3) "The third phase of inquiry which definitely shifts the emphasis from the subject of geography to the children who learn it." Have similar phases occurred in the United States? Has anyone made a study of the subject? These three phases are briefly discussed by Professor Scarfe in one of his recent articles "The Teaching of Geography in Schools" in the June, 1949 issue of *Geography*.

GEOGRAPHICAL PUBLICATIONS

O. G. S. Crawford. **Topography of Roman Scotland.** 162 pages, 32 figures and 21 plates. Cambridge University Press. 1949. **$6.50.**

W. Gordon East. **An Historical Geography of Europe.** 480 pages and 58 maps. Dutton. 3rd edition, 1948. **$6.50.**

Topography of Roman Scotland is concerned with Roman camps, forts and roads in northern Scotland, whereas *An Historical Geography of Europe* is wide-ranging in geographic and historic scope.

This detailed study of the present-day evidences of Roman camps and roads is based on field work and ingenious use of air photographs. It is essentially a guide book for the traveler of historical interests. Preceding the mile-by-mile traverses is a discussion of the types of evidence to be met and of methods of identification.

Professor East's outline of the historical geography of Europe omits Scotland, along with the rest of the British Isles, but does emphasize the Roman Empire. In fact the first part of his book is devoted to the geography of the Roman Empire and the settlement of the border lands on the north. Part II analyzes the evolution of the political pattern of the continent, with emphasis on the nation state. Part III stresses the economic geography of contrasted regions during the Middle Ages and the early years of our era.

In reading this description of different European regions at successive periods one is impressed with the resemblances between this book and *Historical Geography of the United States*, by Ralph Brown. Like Brown, East begins his description with a period for which there is an abundance of geographic data and continues the story thru the period of active railroad building. A comparison of the two books—by Brown and East—will suggest many principles of methodology in historical geography.

George Peabody College for Teachers — J. Russell Whitaker

Griffith Taylor, **Urban Geography,** 439 pp., bibliography, index and 190 illustrations, diagrams. E. P. Dutton & Co., Inc., New York, 1946, $7.50.

As the sub-title indicates this book is "a study of site, evolution, pattern and classification in villages, towns and cities." It is the first English textbook the writer has seen that is completely devoted to urban geography.

This book is divided into three parts. Part I on General Features (87 pages) consists of five chapters. Introduction and Scope of Book is followed by four others which consider Seven Towns in Seven Continents, Effect of Latitude; Characteristics of the Beginning of Settlements; Townships, Land Survey, and Effect on Town Plans and The Evolution of a Large City—Toronto.

In six chapters of 105 pages Part II presents historical changes in the site and pattern of cities from Neolithic to modern times.

Part III, Topographic and Other Controls, might have been redivided. The first six chapters are devoted to topographic and functional controls in modern towns such as geological control, towns sited on rivers, seaports and lake ports, mountain and mining towns, religious centers and resort towns. The last three chapters consider planned cities, regional surveys and classifications of towns.

The book is stimulating, challenging and well written. An abundance of detail provided by the author's own field experience and research, as well as the careful research of others, is presented in support of basic concepts. Although all geographers will not agree on all parts of this book, they will welcome it both as a basic, scholarly, pioneer work as well as a valuable text. For many it should furnish a foundation for research and suggest additional problems in investigation. To those who inquire concerning the content of urban geography, this book will often be cited.

Many will find the bibliography for further reading one of the most useful parts of the book. Some will be disappointed in finding only one picture in the book altho there are some three hundred plans and diagrams.

Indiana University — Thomas F. Barton